I CLAIM:

1. A method for the functional control of a position measuring system, comprising:

placing a scanning unit at a position with respect to a graduation;

generating a first scanning signal and a second scanning signal when said scanning unit is at said position;

forming a first measured position value, P1, in accordance with a first linkage rule that involves said first scanning signal and said second scanning signal;

forming a second measured position value, P2, in accordance with a second linkage rule that involves said first scanning signal and said second scanning signal, wherein said first linkage rule differs from said second linkage rule;

comparing said first measured position value, P1, with said second measured position value, P2; and

generating an error signal as a result of said comparing.

2. The method of claim 1, further comprising:

generating a third scanning signal $C = a + \cos\alpha$;

generating a fourth scanning signal $D = a - \cos\alpha$;

wherein said first scanning signal is represented by $A = a + \sin\alpha$ and said second scanning signal is represented by $B = a - \sin\alpha$, wherein a is a d.c. component and α is an angular value that ranges from 0° to 360° and is proportional to an instantaneous position within a graduation period of said graduation and said scanning signals A, B, C and D are each of which phased-shifted by 90° from each other.

3. The method of claim 2, wherein said first measured position value, P1, is formed in accordance with the following first linkage rule:

$$P1 = \arctan[(A-B)/(C-D)].$$

4. The method of claim 3, wherein said second measured position value, P2, is formed in accordance with the following second linkage rule:

$$P2 = \arctan[(C-D)/(B-A)].$$

5. The method of claim 3, wherein said second measured position value, P2, is formed in accordance with the following second linkage rule:

$$P2 = \arctan[(A-D)/(C-A)].$$

6. A position measuring system, comprising:

a graduation;

a scanning unit that is positioned with respect to said graduation, wherein said scanning unit comprises a detector system that generates a first scanning signal and a second scanning signal at an instantaneous relative position between said graduation and said scanning unit;

an evaluation unit that receives said first scanning signal and said second scanning signal, said evaluation unit forms a first measured position value, P1, based on said first scanning signal and said second scanning signal in accordance with a first linkage rule and a second measured position value, P2, based on said first scanning signal and said second scanning signal in accordance with a second linkage

rule, wherein said first linkage rule differs from said second linkage rule; and

a comparator device that receives said first and second measured position values, P1, P2, so as to generate an error signal as a function of said comparator comparing said first and second measured position values, P1, P2.

7. The position measuring system of claim 6, further comprising a switch-over device that applies said first and second scanning signals to said comparator device pursuant to said first linkage and applies said first and second scanning signals to said comparator device pursuant to said second linkage.

8. The position measuring system of claim 6, wherein said detector system further generates:

a third scanning signal $C = a + \cos\alpha$;

a fourth scanning signal $D = a - \cos\alpha$;

wherein said first scanning signal is represented by $A = a + \sin\alpha$ and said second scanning signal is represented by $B = a - \sin\alpha$, wherein a is a d.c. component and α is an angular value that ranges from 0° to 360° and is proportional to an instantaneous position within a graduation period of said graduation and said scanning signals A, B, C and D are each of which phased-shifted by 90° from each other.

9. The position measuring system of claim 8, wherein said first measured position value, P1, is formed by said evaluation unit in accordance with the following

first linkage rule:

$$P1 = \arctan[(A-B)/(C-D)].$$

10. The position measuring system of claim 9, wherein said second measured position value, P2, is formed by said evaluation unit in accordance with the following second linkage rule:

$$P2 = \arctan[(C-D)/(B-A)].$$

11. The position measuring system of claim 9, wherein said second measured position value, P2, is formed by said evaluation unit in accordance with the following second linkage rule:

$$P2 = \arctan[(A-D)/(C-A)].$$

12. The position measuring system of claim 6, wherein said evaluation unit comprises an interpolation unit.